An Examination of Secondary Manufacturing in British Columbia: Structure, Significance and Trends

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An Examination of Secondary Manufacturing in British Columbia: Structure, Significance and Trends

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by

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Disclaimer

The views expressed in this report do not necessarily represent those of the partners or the cooperating groups.

The report is available from:

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EXECUTIVE SUMMARY

British Columbia, similar to many other domestic and international jurisdictions, is seeking to expand value-added manufacturing in forest products. Given the significance of the forest sector to British Columbia, the emerging impacts of reduced timber access and highly competitive global markets, it is important that decision-makers seeking to promote an expansion in secondary manufacturing are able to draw upon accurate sector information in order to complete realistic assessments of various options. In addition, this information base will complement the impact monitoring of various polices and programs dedicated to promoting sector growth.

This report presents the results of a 1998 survey of the British Columbia solid wood secondary manufacturing industry. The project was designed to gather operational data on 1997 sector activity to update information produced from earlier industry surveys completed for 1990 and 1994. In addition, the database collected for the project will also be used to support FRBC efforts to examine the effectiveness of their value-added program and by the BC government. The 1997 industry information is analyzed to provide a quantitative and qualitative examination on the current structure and significance of the sector, and a discussion on the major challenges confronting secondary manufacturing. In addition, the report provides a definition for secondary manufacturing and outlines the basis for the strong interest among various sector stakeholders in secondary manufacturing.

The survey population totaled 774 firms -- 445 firms returned usable responses, for a response rate of 58%. The response level was supplemented by including additional company specific information available from other sources. The inclusion of this information produced a working sample rate of 66%.

The survey asked firms to provide information on their activity in 1997, including products manufactured, employment, raw material use (by volume, species and sources), sales revenue, markets, operating costs, capacity utilization, expansion plans, challenges to expansion, mill location and contacts. As in the previous surveys, the industry was aggregated into seven sub-sectors or business types: remanufactured products, engineered building components, millwork, cabinets, furniture, pallets and containers, and other wood products. However, this survey included two additional business types, both of which satisfy the working definition of secondary manufacturing: panelboards, and shakes and shingles.

A selection of the report highlights is provided below.

- Employment (full-time equivalents) in BC's secondary manufacturing sector in 1997 is estimated at 19,490. Sector employment for the seven business types (BTs) totaled 14,457 workers or about the same level as in 1994. Firms employed

an average of 30 people while median employment was in the 11-15 range of employees per mill.

Total sector sales are estimated at $3.87 billion. This constitutes about 22% of total BC forest product sales in 1997. Sales for the seven BTs totaled $2.69 billion, up about 40% from 1994 measured in nominal dollars. Average respondent sales were $6.8 million while median sales were in the $1.1-3.0 million range.

Adjusting for inflation over the 1990-1997 period, total sector sales in 1997 were $3.53 billion in constant 1990 dollars. Making the same adjustment for inflation, sales for the seven BTs are $1.86 billion in 1994 and $2.45 billion in 1997; an increase of 59% over the 1990-97 period.

The sector is estimated to have processed approximately 17.9 million m^3 of fibre in roundwood equivalents in 1997.

	1990	1994	1997[a]	1997[b]	1997/90[c] % Change
Firms (#)	565	525	683	774	21
Sales ($B)	1.54	1.93	2.69	3.87	75
Employment	11,660	14,010	14,457	19,490	24

Note: Columns **a** and **c** are based on the seven Business Types used in the 1990 and 1994 data. Whereas column **b** is based on nine Business Types (Panelboards and Shakes & Shingles are added).

The industry is concentrated in the Vancouver Forest Region (61% of firms) and the Kamloops Forest Region (22% of firms).

Estimated capacity utilization (on a single shift basis) ranged from 66% to 77% among all the BTs and averaged 71%. About 21% of responding firms operated on a two-shift basis and only 2% of firms reported operating at a three-shift basis.

Almost one half of the respondents (47%) relied on British Columbia for over half of their sales and 20% of the respondents had at least one half of their sales to the United States. BC was the most common market among respondents, 89% had sales into BC, 61% reported sales into the United States and 41% had sales in Asia (18% in Japan).

Remanufactured Products (Reman) was the largest business typed in the sector, accounting for about 25% of all firms. Reman firms tended to be larger than in the other BTs (except for Panelboards); Reman accounted for an estimated 32% of employment and 40% of sales revenue generated in secondary manufacturing.

BACKGROUND

The Canadian Forest Service (CFS), Forest Renewal BC (FRBC) and the Ministry of Forests (MoF) partnered to develop and deliver this survey in cooperation with industry to examine the structure and significance of solid wood secondary manufacturing in British Columbia. Earlier, in cooperation with CFS and industry, the Forest Economics and Policy Analysis Research Unit at the University of British Columbia (1995), Price Waterhouse (1992) and Forintek Canada Corp. and Jim McWilliams (1993), conducted surveys that characterized the industry in 1990/91 and 1994. The CFS interest is based on a commitment to delivering timely research on the sustainability and competitiveness of Canadian forestry. The British Columbia government is actively exploring options to maintain or increase employment related to the province's timber harvest -- a harvest that can be expected to decline in the future due to, among other factors, the fall-down effect and changes in land use and forest management policies. Thus, information on the current status of the industry is required in order to complete meaningful assessments of the opportunities and options for increasing the value of the forest product mix. Updated data will also be useful to industry associations in their efforts to improve performance in and expansion of the sector and in multi-stakeholder policy discussions.

This report analyzes the information assembled on 507 companies active in solid wood secondary manufacturing in British Columbia in 1997. Section 1 provides a definition of secondary manufacturing and comments on the basis for the strong interest among stakeholders in secondary manufacturing. Section 2 describes the survey methodology used. Section 3 presents the survey results and a discussion on the structure and significance of the sector. Section 4 compares the characteristics of the various business types (aggregations of specific products) within the sector. Section 5 provides sector estimates and an historical comparison of the survey results for the 1990's. Section 6 concludes with a brief discussion of the strengths and challenges to secondary manufacturing in BC.

SECTION 1: INTRODUCTION

What is Value-Added Manufacturing?

In value-added manufacturing, wood products firms obtain primary wood materials and transform them into other products. However, the term value-added generally invokes a strong reaction from those involved in the production of primary products, with a claim that they too are adding value. This is a reasonable position. Indeed, the adding of value accrues throughout the total forest regime from planting, silviculture, harvesting and handling, processing, manufacturing, and marketing. A more

accurate term for this conversion of primary wood materials is **secondary manufacturing**.

Secondary manufacturing is the further processing of primary mill wood or wood-based material into semi-finished or finished products. The major wood products in the secondary-manufacturing industry include remanufactured products (Reman), millwork, engineered wood products (EWP), cabinets, furniture, pallets and containers, panelboard products, shakes and shingles, and other wood products (OWP). Although there is a wide range of specific products within these groupings, a reasonably comprehensive listing and logical taxonomy of the products produced in solid wood secondary manufacturing are presented in Table 1.

Table 1. Taxonomy to Secondary Manufactured Wood Products

Log Products	Wood Products		
	Primary[a]	**Intermediate**	**Final**
Chopsticks	Boards	Building/Home Components	Boxes, Bins and Crates
Firewood	Cants	Cutstock	Cabinets
House Logs	Flitches	Door Stock	Coffins
Pilings	Lumber/Industrial	Edge Glued Components	Countertops
Poles	Timber	Finger-Jointed Stock	Decking
Posts	Treated Timber	Furniture Components	Doors
Log Homes	Veneer	Joinery Stock	Fencing
Shakes		Ladder Stock	Finger-Jointed Lumber
Shingles		Laminated Components	Flooring
Treated Pilings		Laminated Stock	Flooring/Engineered
Treated Poles		Metric Stock	Furniture/Commercial
Treated Posts		Moulding, Panel Blanks	Furniture/Household
Wood Novelties		Pallet, Crating Stock	Furniture/Patio
		Medium Density Fibreboard	Furniture/RTA
		Particleboard	Garden Buildings, Products
		Pattern Stock	Laminated Veneer Lumber
		Sawmill Specialty Products	Millwork/Architectural, Custom
		Staircase Components	Medium Density Fibreboard
		Turning Squares	Mouldings
		Window Stock	MSR Lumber
			Oriented Strandboard
			Pallets
			Paneling
			Plywood
			Prefab Buildings and Manufactured Homes
			Siding
			Staircases
			Stakes, Lathe, Strips and Batten
			Structural Laminated Beams
			Treated Lumber
			Trusses
			Turned Wood Products
			Windows
			Wood Novelties

Based on Wilson and Ennis (1993). [a] This column is not secondary products but is included for completeness.

Why the Interest in Secondary Manufacturing?

The strong and widespread interest among the various forestry stakeholders to expand secondary manufacturing in forest products is common to a number of timber producing and importing jurisdictions, including the major timber exporting regions of Scandinavia, Chile, New Zealand, and the US Pacific Northwest.

The interest in secondary manufacturing among the various sector stakeholders is for quite different reasons. Wood products secondary manufacturing is seen by governments as a vehicle to maintain or expand the level of economic activity (jobs, sales and exports) generated from the timber harvest (often a declining level of harvest). The transition to an information-based economy with highly automated manufacturing has produced many remarkable achievements but it has also produced displacement, stranded capital and changes in real valuations for commodities. The displacement includes pronounced and prolonged structural unemployment, labour that is not adequately skilled to compete in an information-age labour market. The impact of the displacement is compounded because it is increasingly difficult to create or stimulate industrial employment opportunities in the global economy. Open markets, production factor mobility, international institutions, and production efficiencies are increasingly incompatible with national and regional development or employment objectives. Governments are interested in secondary manufacturing because it generally offers greater labour-intensity levels, can be located near the timber resource and there is a degree of skill transferability for labour displaced in primary forestry activity.

Table 2 provides a summary of the direct employment derived from a standard volume of round wood equivalent in various types of forest product activity. The jobs in secondary manufacturing are incremental to those in harvesting, handling and primary processing. Thus, the same timber creates jobs in all these activities.

Table 2. BC Forestry Sector Employment Coefficients

Business Type (BT)	Jobs per 1000 m^3 RWE
Engineered Wood Products (EWP)	1.84
Cabinets	10.33
Furniture	7.66
Millwork	1.75
Other Wood Products (OWP)	0.70
Pallets & Containers	0.82
Remanufactured Products	0.50
Panelboard Products	0.75
Shakes & Shingles	0.96
Total Forest Sector[a]	1.10

Notes: RWE = round wood equivalent. Panelboards see page 7. [a] Delcourt and Wilson (1998).

The public now has ready, inexpensive access to information about the negative environmental impacts of commercial forestry and in exchange for a more acceptable

level of these impacts, the public is increasingly demanding maximum local activity from the harvest.[1] Many environmentalists view secondary manufacturing as a route to preserve additional forestland without the consequent reduction in employment. The basic logic is to maintain or increase forest sector employment by shifting displaced workers into secondary manufacturing by getting more manufacturing activity out of the timber that is harvested.

Organized labour is concerned about the substitution of capital equipment for high paying jobs in the primary manufacturing sector. Good employment alternatives are not readily available outside the resource sectors, so labour looks for new opportunities within the forest sector. The skill set of the displaced workers can, to a limited degree, and with adequate training complement this transition.

The forest industry responds to a mixture of market signals (both in terms of rising timber costs and relative product prices) and to the government's objectives, which are signaled via various expenditure or command and control measures, by seeking alternatives for increasing investment in secondary manufacturing. Given the mix of policy objectives, the overlapping of policies across time, and fluctuating markets, it is unlikely that the package of signals will be a cohesive one.

SECTION 2: METHODOLOGY

The inventory of companies (i.e., the survey population) was developed through an extensive effort to update a CFS database on BC secondary manufacturing. The update used the membership lists of various producer associations, commercial directories, regional lists compiled by staff from Forest Renewal BC, and reviews of the company inventory by sector experts.

The initial mail-out of the questionnaire was in mid-August, 1998 and a follow-up mail-out was in mid-October, 1998. A copy of the survey is provided in Appendix A. Questionnaires returned by Canada Post were checked for address accuracy and business status of the firm. The checking included a company search using the electronic phone directory available on the internet. The population was adjusted accordingly. Within the remaining population, firms not responding to the mail-outs were contacted by phone during November - December, 1998 seeking their participation.

Based on feedback from the companies during this project it is clear that the number of direct surveys to secondary-manufacturing firms needs to be reduced and that both the results of the survey work and their significance be communicated to the

[1] The targets for forest management and environmental impacts are both dynamic. It is also interesting to note that the social expectations for forest management are being translated into market-driven certification vehicles and into a slowly emerging redefinition of private property rights with respect to forestlands.

industry and sector stakeholders. The BC firms demonstrated a willingness to cooperate with initiatives designed to provide the information necessary to complement sector performance but companies did note that there is a need to coordinate these initiatives in order to reduce the number of surveys.

The identified population is 774 firms and in total, 445 surveys were returned for a response rate of 58%. The response rate was further developed with additional information from other industry sources producing a working sample rate of 66%. The survey population, response rate and the working sample rate are summarized by business type in Table 3.

A two-part questionnaire was used to provide additional confidentiality to the respondents. The first part asked for contact information, products, species and markets to be used in the completion of a BC company and product directory. The second part of the questionnaire asked for information on mill location, association affiliation, products, markets, employment, plant capacity utilization and any expansion plans, machinery, custom services, wood raw material use, species, source of lumber/log supply, sector challenges, sales, and operating costs.

In order to protect respondent confidentiality with respect to the information provided in Part B of the questionnaire, the survey results for Part B are presented in an aggregated manner. Because not all the firms responded to every question the analysis and discussion in this report, except where noted, is based on those firms responding to the particular question.

Each firm in the working sample was classified into a specific business type (BT) based on the firm's reported distribution of and type of product sales. The nine business types are Reman, EWP, Millwork, Cabinets, Furniture, Pallets and Containers, Shakes and Shingles, Panelboards and OWP. In order to stay within the definition of secondary manufacturing, plywood producers, the major component in the Panelboards BT, were asked to complete the survey net of all mill activity related to veneer operations. A description of the products within each BT is provided in Appendix B.

The number of firms in the survey population in each business type and the associated survey response rates, are shown in Table 3. The firms were also classified according to the Forest Region in which the mill operated. The Forest Regions are as defined by the BC Ministry of Forests (which are also consistent with FRBC's regions).

Table 3. Survey Population, Response, and Working Sample

Business Type	Number of Firms			
	Population	Respondents	Working sample[a]	Response (%)[b]
Reman	190	124	153	65
Engineered Wood Products	152	80	99	53
Millwork	121	71	74	59
Cabinets	100	50	52	50
Furniture	64	34	36	53
Pallets & Containers	17	8	11	47
Panelboards	19	15	17	79
Shakes & Singles	72	32	39	44
Other Wood Products	39	31	26	80
Total	774	445	507	58

[a] The working sample includes the respondents and additional company specific information gathered from other sources and added to the data base to improve the accuracy of the analysis.
[b] The response rate is calculated by dividing the number of survey respondents by the population.

SECTION 3: OVERVIEW OF SECONDARY MANUFACTURING

Business Types

Respondents were asked to indicate the product group that accounted for the greatest share of their sales. This assignment was cross-checked against the proportion of company sales by the listed products sold and the firm was then classified by business type. As can be seen from Table 3, most of the firms are classified as Reman (25%), Engineered Wood Products (20%), and Millwork (16%).

Table 4 provides a regional distribution summary of the firm population by business type. About 61% of the firms are Coastal operators (the Vancouver Forest Region) and 39% are Interior operators: primarily in the Kamloops (22%) and Nelson (7%) Forest Regions. Among the nine business types the Interior region has a greater number of Panelboard and Engineered Wood Products firms than the Coastal region.

Table 4. Regional Distribution of Firms by Business Type for Population

Business Type	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Interior Total	Coast (Vanc.)
Reman	10	35	12	19	3	79	111
EWP	11	50	15	8	5	89	63
Millwork	0	22	7	4	0	33	88
Cabinets	2	27	2	2	0	33	67
Furniture	1	15	0	2	0	18	46
Pallets	0	4	0	0	1	5	12
Panelboards	4	3	2	2	1	12	7
Shake & Shingles	3	3	7	2	2	17	55
OWP	0	9	7	2	0	18	21
Total	**31**	**168**	**52**	**41**	**12**	**304**	**470**
Percentage	**4**	**22**	**7**	**5**	**2**	**39**	**61**

About one-quarter of the respondents offered some form of customized processing. Most Reman firms provide custom resaw and planing services. About one-quarter of the Reman firms also sell custom kiln drying (KD). Table 5 provides a summary of the proportion of respondents by business type that offer a selection of custom services. A total of 11 firms that were included in the Working Sample were actually custom operators selling custom processing services to secondary manufacturers without taking ownership of the wood.[2]

Table 5. Companies Performing Custom Services by Business Type

	Custom process			
	Kiln Dry	Resaw	Planing	Other
	%			
Reman	28	51	55	37
Millwork	6	20	35	22
Engineered Wood Products	12	17	12	25
Cabinets	0	3	6	18
Furniture	7	15	7	7
Pallets & Containers	17	50	0	0
Panelboards	7	7	7	43
Shakes & Shingles	17	22	4	4
Other Wood Products	4	9	17	30
Total	**14**	**27**	**27**	**26**

Employment and Plant Size

Figure 1 shows plant size distribution by number of employees (full-time

[2] Wood use figures reported by custom operators are not included in the calculations in this study in an effort to avoid double counting.

equivalents) in 1997. The median employment size of respondent plants was in the 11-15 employee range, with 53% of the plants employing 15 or fewer people. There were few very large firms and average employment was 30 people per firm. The Vancouver Forest Region accounted for 54% of reported employment, the Kamloops Forest Region 24%, and the Prince George Forest Region 10%.

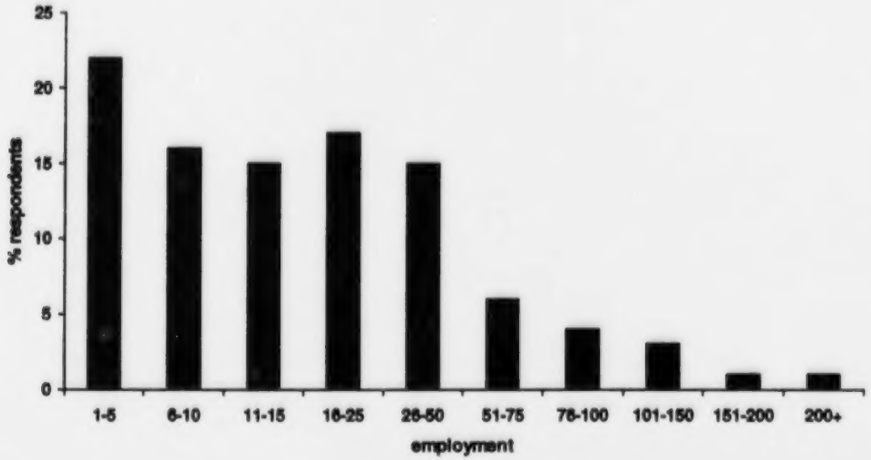

Figure 1. Distribution of Firms by Employment Size

Raw Material Use[3]

Firms were asked to estimate their wood use in 1997. This included logs, lumber, plywood, oriented strandboard and other (specification and units of measure were requested on this selection). This material use was converted into roundwood equivalents. Based on the Working Sample for the seven business types, the estimated roundwood utilization level is 9.3 million m^3. Lumber accounted for 52% of this total, logs 47% and plywood and other panelboards combined, the remainder. Overall, firms in the Working Sample supplied employment of about 1.14 full-time equivalents for every 1,000 cubic metres of timber processed. The inclusion of the Panelboards and Shake & Shingles business types increases the estimated utilization level to a total of 13.4 million m^3.

[3] Various types of raw material were reported and in an effort to provide an estimate of the total material use the figures were converted to roundwood equivalents using the following assumptions: Interior sawmills recover 210 fbm of lumber per cubic metre of logs and Coastal mill recover 235 fbm.; 1000 ft^2 of 3/8" plywood equals 31.2 ft^2 of lumber and plywood yield is 55% of log volume, yielding a conversion factor of 1.6 m^3/Msf; and the conversion factor for panelboard is 2.0 m^3/Msf.

Firms were also asked about the species of wood they used -- Western red cedar, Douglas-fir, lodgepole pine and spruce were the species used by the greatest number of firms (see Figure 2). Western red cedar accounted for the largest portion (28%) of the estimated volume of roundwood equivalents used by firms in the Working Sample, followed by Douglas-fir (15%), spruce (12%), lodgepole pine (11%) and hemlock (9%). However, a comparison of species utilization by proportion across the business types illustrates a large degree of variation (see Figure 3). In Reman the three major species used by volume were cedar (37%), SPF (20%), hemlock (14%) and lodgepole pine (13%), whereas in Millwork the three are Douglas-fir (31%), cedar (12%) and hemlock (10%). Panelboards are 32% spruce and 30% Douglas-fir. Pallets & Containers are about 60% SPF species. As expected, cedar constitutes 96% of the wood supply used in Shakes & Shingles production. Cabinets is 76% hardwoods (primarily oak and maple) and Furniture is 36% hardwoods.

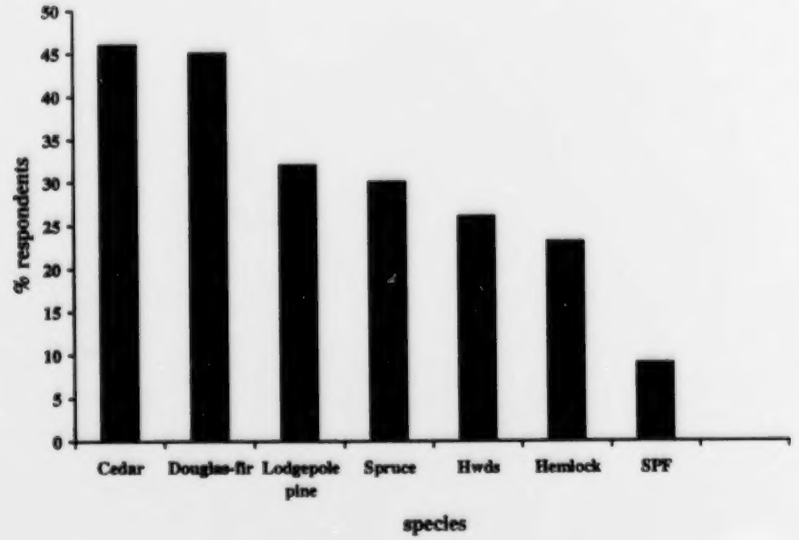

Figure 2. Distribution of Firms by Species Use

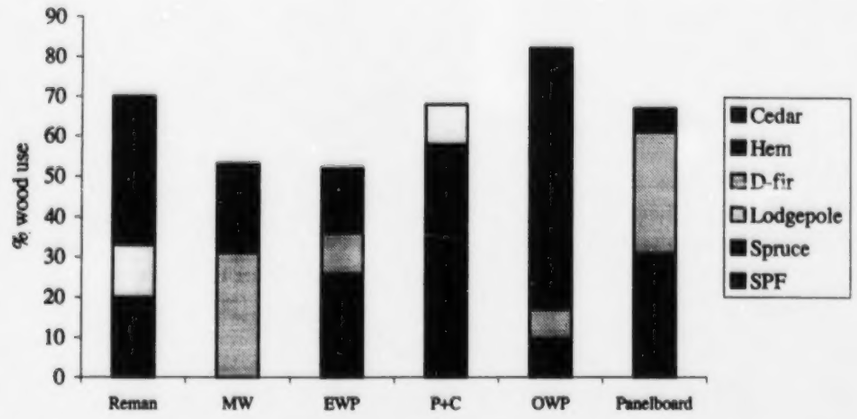

Figure 3: Top Three Species Utilization by Business Type

Sales Revenue and Operating Costs

Figure 4 shows the distribution of firms in the Working Sample by 1997 sales revenue. Median revenue lies in the $1.1-3.0 million range, with 72% of plants earning revenues of $5 million or less. However, plants with sales revenue of more than $5 million earned approximately three-quarters of total respondent sales, and the average respondent had sales worth $6.8 million. Firms in the Vancouver Forest Region earned 57% of the estimated total earnings of respondents and firms in the Kamloops Forest Region accounted for 19%.

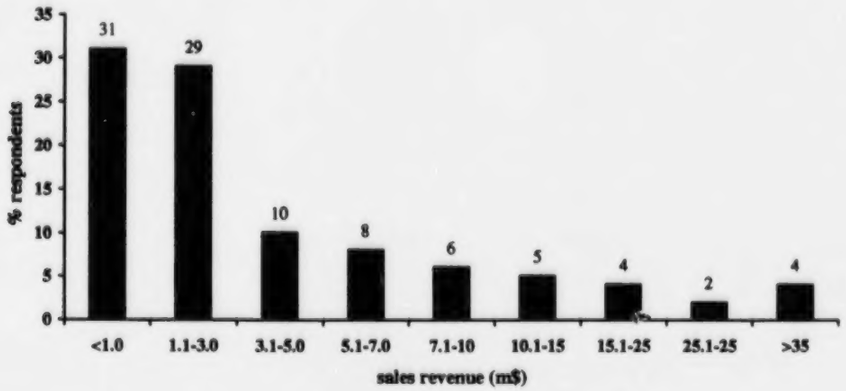

Figure 4. Distribution of Firms by Sales Revenue

Respondents were asked to list the proportion of their operating costs accounted for by wood, labour, interest payments, depreciation and amortization, and other production costs. Proportions varied widely among respondents, but on average 77% of total costs in 1997 resulted from purchases of wood (46%) or wages, salaries and benefits (31%) (see Figure 5).

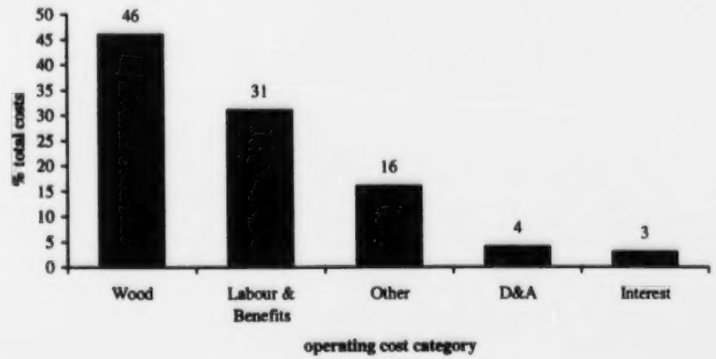

Figure 5. Average Distribution of Operating Costs

Markets Served

British Columbia was the major market in 1997 for almost one half (47%) of the firms in the solid wood secondary manufacturing industry. About 90% of the respondents reported some sales in the BC market (see Figure 6). However, it is important to note that the significance of the domestic market is somewhat overstated by these numbers because the data presented for sales to the BC and Rest of Canada (ROC) markets includes re-shipments to other export markets. Market diversification within firms was limited. In addition to the heavy BC market concentration, 20% of the companies sold more than half of their shipments in the US market and 7% sold more than half to Asia. The ROC and Europe were major markets for a small number of respondents.

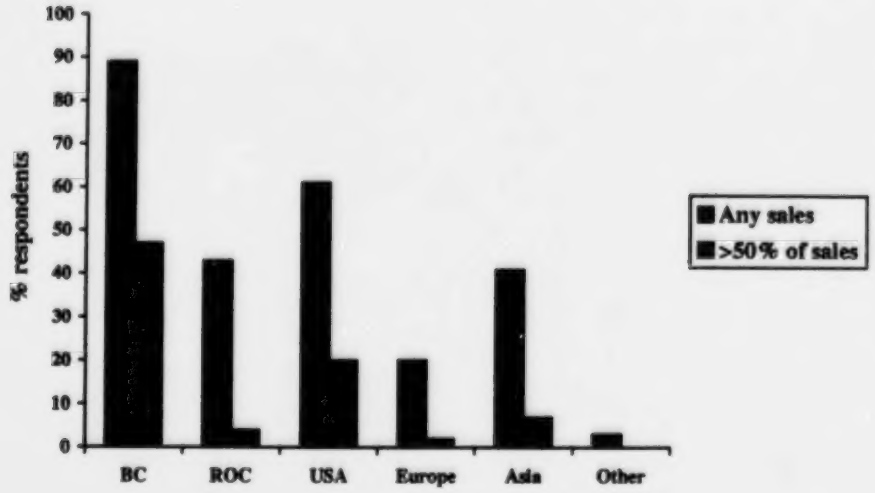

Figure 6. Importance of Various Markets

As shown in Figure 7, the domestic market accounted for 60% of total sales (51% in BC and 9% in the Rest of Canada). The United States was the second major market at 24% of shipment values followed by Asia at 11%.

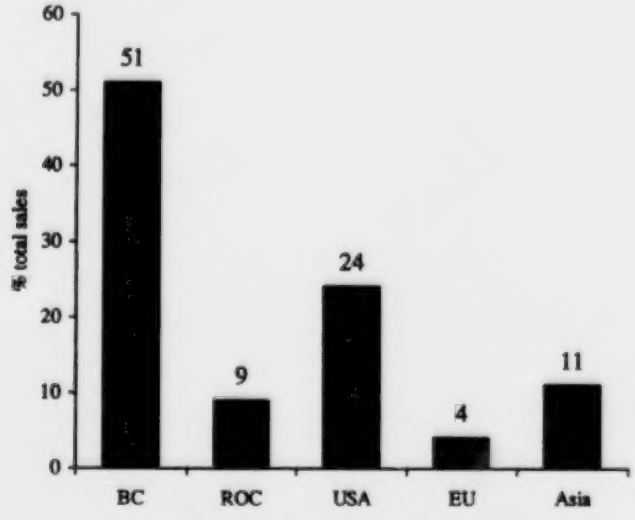

Figure 7. Sales Revenue by Market

Capacity Utilization and Capacity Expansion Plans

Firms in the Working Sample operated at an average capacity utilization level of 72% in 1997. Firms operating two shifts (21% of respondents) reported 76% capacity utilization and the few firms operating three shifts (2% of respondents) reported 86% capacity utilization. Based on sales levels, larger respondents tended to have higher capacity utilization rates. Rates varied considerably across the Forest Regions; in the Prince Rupert region utilization rates averaged 69% and the Cariboo Forest Region reported 80%. Both Vancouver and Kamloops Forest Regions reported capacity utilization at 72%.

Despite fairly high average excess capacity in 1997, 53% of firms in the Working Sample said that they planned to expand their capacity over the 1998-2000 period by an average of 54% of existing capacity. However, many firms planning expansion also noted a series of challenges to realizing this expansion. A large majority of firms in the Working Sample (85%) indicated that fibre supply problems represented a constraint facing the industry. Fibre constraints identified by respondents include availability, cost, quality and stability of supply.[4] Labour costs, skills and flexibility were identified as impediments to expansion by 68% of the firms. Marketing difficulties were noted by 67% of respondents. More specifically, in answer to a series of questions regarding constraints to expansion, 37% identified labour training/skills, 38% identified labour costs, 37% fibre costs, 34% fibre quality/grade, 32% fibre availability and 33% access to quota under the Canada/US Softwood Lumber Agreement as constraints (see Table 8).

SECTION 4: COMPARISONS AMONG THE BUSINESS TYPES

This survey was broadened to include both panelboard and the shake & shingle producers. Working with a definition that secondary manufacturing is the further processing of primary mill wood or wood-based material into semi-finished or finished products, both of these manufacturing activities meet this definition. However, the inclusion adds an additional pair of business types to the standard seven business types selected and analyzed in previous surveys of BC secondary manufacturing. In order to facilitate comparisons with previous surveys and the analysis of sector trends both Shake & Shingles and Panelboard BTs are reported separately.

Employment and Plant Size

Reman firms accounted for an estimated 32% of 1997 direct employment (full-time equivalents), Panelboards 19%, Engineered Wood Products 15%, Millwork 11%, Shake

[4] Interestingly, some respondents ascribed the fibre supply problems to a control of the fibre supply by major integrated firms, while others ascribed it to government policies.

& Shingles 8%, Cabinets 7%, Furniture 5%, and the other two BTs combined 4% (see Table 6).

Table 6. Percentage of Economic Contribution by Business Type

Business Type	Sales (% of total)		Jobs (% of total)	
	7 BTs	9 BTs	7 BTs	9 BTs
Reman	56	40	43	32
Millwork	10	7	15	11
Engineered Wood Products	19	14	20	15
Cabinets	5	3	10	7
Furniture	3	2	7	5
Pallets & Containers	1	1	2	1
Panelboards	--	22	--	19
Shakes & Shingles	--	7	--	8
OWP	5	4	5	3

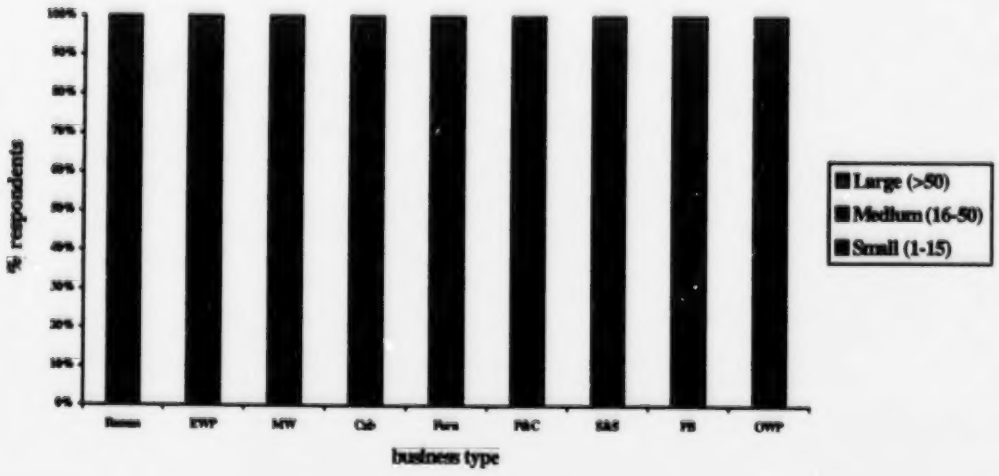

Figure 8. Employment Size by Business Type

Figure 8 shows 1997 employment size distribution by business type. Respondents were classified as small (under 16 employees), medium (16-50 employees) or large (over 50 employees). Small firms dominated except in Panelboards where about 80% were

large and Reman where two-thirds of respondents were of medium or large size. Panelboard firms employed an average 165 workers and Reman firms employed an average of 32 people. The average for all secondary manufacturing firms is 30 employees per firm.

Raw Material Use

Reman accounted for about 76% of the lumber processed by the Working Sample and Millwork and Engineered Wood Products about 10% each.

When the various types of raw material are converted to roundwood equivalents, Reman used 52% of the total, Panelboards 26%, Engineered Wood Products 7%, Millwork 5%, Shakes & Shingles 4%, Other Wood Products 4%, and Pallets & Containers, Furniture and Cabinets each accounted for less than 1%. These figures reflect both the relative sizes of the various product groups (in terms of the number and average size of plants) and the clear differences among them in their raw material requirements (see Table 2).

There were considerable differences among the BTs in terms of jobs provided per thousand cubic metres of roundwood equivalents used. The major BT sources of employment, in absolute terms, generated the following jobs/M m^3 timber ratios: Reman 0.50, Panelboards 0.75 and Engineered Wood Products 1.84 (see Table 2).

Sales Revenue and Operating Costs

Firms classified in the Reman business type accounted for 40% of the estimated total 1997 sales revenue of firms in the Working Sample, Panelboards 22%, Engineered Wood Products 14%, Shake & Shingles 7%, Millwork 7%, and Cabinets 3% (see Table 6). Figure 9 illustrates 1997 sales revenue distribution by firm size and business type. Respondents were classified as small (under $5 million sales), medium ($5-$10 million sales) or large (over $10 million). Small firms dominated in each business type except Panelboard firms which averaged $42.9 million in sales, Shakes and Shingles $8.8 million and Remanufactured Products $8.7 million.

Survey results provide a breakdown of operating costs across the various BTs (see Figure 10). Wood costs were most significant for Reman and Shake & Shingles operations. On average the Reman operator spends about 54% of operating expenditures on wood and 27% on labour (including benefits). In contrast, labour costs were at least as important as wood costs for both Millwork and Cabinet firms.

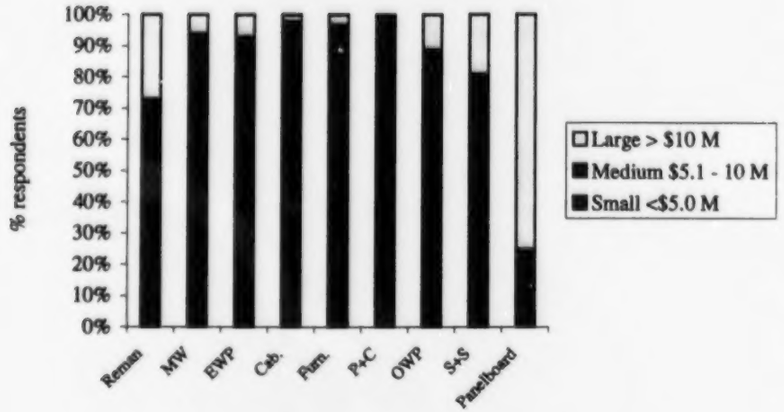

Figure 9. Sales Revenue by Firm Size and Business Type

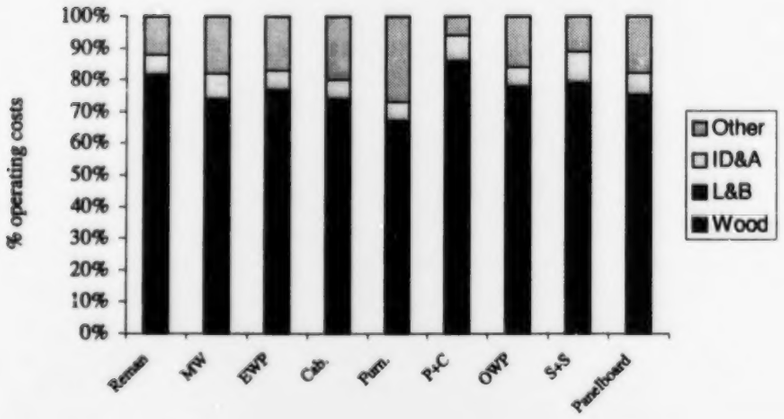

Figure 10. Distribution of Operating Costs by Business Type

Markets Served

Figure 11 shows the estimated proportion of 1997 sales of firms in the Working Sample in each business type in the five major markets for the BC solid wood secondary manufacturing industry. Sales to regions other than those shown were relatively small. Reman respondents were the most export-oriented of the business types, generating in excess of 60% of their sales from exports. An estimated 39% of Reman sales is in the domestic market (31% in BC). However, industry representatives confirmed that a

number of Reman companies sell to domestic wholesalers for subsequent shipment to the US market. Shakes & Shingles are near evenly split between the US and domestic markets. In contrast, the Cabinets sales were 90% into the BC market. Millwork and Furniture operations derived 15-20% of their 1997 revenue from sales to the United States. In general, respondents in the other business types were dependent on the BC and ROC markets for most of their sales.

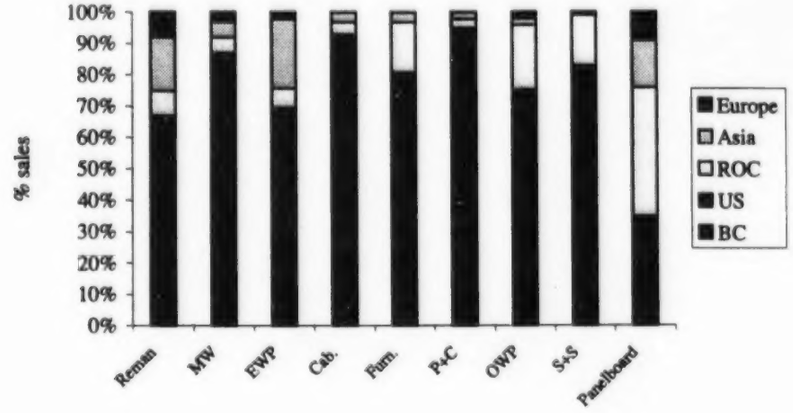

Figure 11. Sales Revenue by Market and Business Type

Capacity Utilization and Capacity Expansion Plans

There were significant differences in the average capacity utilization rates for the sector among the BTs -- rates ranged from 69% to 83% (see Table 7). The average utilization rate was 72%. Reman operated at 70% capacity and Panelboards at 83%. Capacity utilization by Forest Region ranged from 69% in Prince Rupert to a high of 80% in the Cariboo Forest Region (see Table 8).

Although there was a high degree of excess capacity in each of the various BTs (average capacity utilization was 72% for the sector), many respondents in each business type indicated they planned to expand capacity in the 1998-2000 period. Table 9 summarizes the frequency and magnitude of planned expansions among the business types. It is interesting to note the positive outlook of the Reman business type despite the dependence on the US market and the uncertainty of the softwood quota situation.

Table 7. Average Capacity Utilization by Business Type

Business Type	1 Shift	2 Shifts	3 Shifts	All
		%		
Reman	66	77	90	70
Millwork	71	86	n.a.	73
EWP	72	65	n.a.	69
Cabinets	76	73	n.a.	75
Furniture	74	78	n.a.	76
Pallets & Containers	72	n.a.	n.a.	76[a]
Panelboard	65	88	85	83
Shakes & Shingles	72	n.a.	n.a.	70
Other WP	77	83	n.a.	78
Total Secondary	**71**	**76**	**86**	**72**

[a] This is greater than the only reported capacity number as 1 firm reported 100% capacity but no information on the number of shifts.

Table 8. Average Capacity Utilization by Forest Region

Forest Region	1 Shift	2 Shifts	3 Shifts	All
		%		
Vancouver	71	77	80	72
Prince George	66	71	95	70
Prince Rupert	65	75	n.a.	69
Nelson	73	71	90	73
Kamloops	70	77	80	72
Cariboo	78	85	90	80
Total Secondary	**71**	**76**	**86**	**72**

Table 9. Expansion Plans and the Average Planned Capacity Expansion

Business Type	Planning to Expand	Expansion Amount
	% of firms	%
Reman	52	66
Millwork	55	48
Engineered Wood Products	62	45
Cabinets	38	72
Furniture	70	59
Pallets & Containers	50	13
Panel Products	50	41
Shakes & Shingles	56	44
Other Wood Products	35	44
Total	**53**	**54**

Respondents were asked to select the major constraints to expansion from among specific items in wood supply, labour and marketing. Table 10 provides a

summary of the frequency that each constraint item was selected. With respect to wood supply the volume available was selected most frequently by Shake & Shingle BT followed by the Reman, EWP and Panelboard BTs; price was selected by almost two-thirds of the Panelboard respondents, 60% of Shake & Shingles and 40% of Reman respondents. Quality/Grade was selected by about 40% of Shake & Shingle and Millwork BTs. Price volatility was selected by about one-third of EWP and Millwork BTs.

The labour constraint included a training/skills item, which was selected by 55% of EWP and 40 – 45% of Cabinets, Furniture and the Shake & Shingles BTs; a cost item, which was selected by two-thirds of Pallets & Containers and 30 – 45 % of all the other BTs (with the exception of Furniture; and a flexibility item, which was selected by 25 – 35% of Pallets & Containers, EWP, and Shake & Shingles BTs.

Under the marketing constraint about two-thirds of the Reman respondents and one-third of EWP and Shake and Shingles selected access to US quota as a major constraint to expansion; about one-quarter of the Reman, EWP, Cabinets, Shake & Shingles, and Panelboard respondents selected the lack of market diversification; and about 40% of Panelboard respondents also selected the need to increase product diversification.

Table 10. Major Constraints to Expansion

Constraint	Reman	EWP	Mill	Cabs	Furn	Pallet	Panel	S&S	OWP	All
	% of Firms Selecting Constraint									
Labour:										
Training/skills	28	55	35	47	41	33	14	39	30	37
Cost	44	40	33	32	19	67	43	35	48	38
Flexibility	21	25	10	24	15	33	14	26	13	20
Markets:										
Access US quota	65	27	22	6	4	17	0	30	17	33
Market Divers	25	20	18	24	11	17	29	30	9	21
Product Divers	18	18	12	18	11	0	43	17	9	17
Market/Prod Res	14	12	12	12	22	0	21	4	22	14
Wood Supply:										
Volume	53	50	22	6	11	33	50	57	39	32
Price	38	42	24	35	33	0	71	57	35	37
Quality/grade	33	35	45	29	30	33	36	43	30	34
Price volatility	27	38	35	24	22	17	7	30	48	30

SECTION 5: AN OVERVIEW TO THE SECTOR IN THE 1990's

Based on the Working Sample at 66% of the population, total sector estimates were calculated for sales, employment and wood use. The statistical properties of the data were examined in detail and because of the skewed response distribution it was determined that the median was the appropriate measure to use in developing the sector estimations.

Sector sales totaled $3.87 billion in 1997 (or $3.53 billion in constant 1990 dollars) for the nine BTs (see Table 11).[5] Secondary manufacturing constituted about one-fifth of total provincial forest product shipments in 1997.[6] Measured in constant 1990 dollars, total sales for the seven BTs were $2.45 billion in 1997 and $1.86 billion in 1994. Thus, after adjusting for inflation, sector sales increased about 59% in 1997 versus 1990. Total employment in secondary manufacturing was 19,490 and totaled 14,457 for the seven business types.

The sector is estimated to have processed approximately 17.9 million m^3 of roundwood equivalents in 1997. The seven BTs are estimated to have used 12.2 million m^3.

Table 11 provides a summary of the major trends in BC solid wood secondary manufacturing industry over the 1990-97 period. This comparison is based on three distinct industry surveys completed during this period. Estimates of total industry number of firms, employment, raw material use and sales revenue are provided. In order to compare across the surveys the 1997 sector totals are also presented based on the standard seven BTs (excluding Panelboards and Shakes & Shingles).

Employment has increased by about 24% over the 1990's and sales, measured in nominal terms, has increased by about 75%.

Table 11. Trends in BC Secondary Manufacturing

	1990	1994	1997[a]	1997[b]	1997/90[c] % Change
Firms (#)	565	525	683	774	21
Sales ($B)	1.54	1.93	2.69	3.87	75
Employment	11,660	14,010	14,457	19,490	24

[a] Based on seven BTs.
[b] Based on nine BTs (i.e., including Panleboards and Shakes & Shingles).
[c] Ratio is based on seven BTs.

[5] The GDP deflator index was used to convert sales values to constant 1990 dollars.
[6] This estimate is developed with an adjustment in sector sales to correspond with the products that are included in the Statistics Canada estimate for the value of BC forest product shipments.

The sector totals were collected into the Interior and Coastal geographic regions to provide a sense of their respective contributions. The Coastal region, which is the equivalent to the Vancouver Forest Region, has 61% of the secondary manufacturing firms identified in the population (see Table 4). These Coastal firms contribute about 56% of sector sales and 55% of the direct employment (see Table 12).

Table 12. Geographic Distribution of Secondary Manufacturing Activity

	Interior 7 BTs	Interior 9BTs	Coastal 7BTs	Coastal 9BTs
Firms (#)	275	304	408	470
Sales ($B)	1.071	1.695	1.622	2.176
Employment (FTEs)	6,153	8,870	8,304	10,620

SECTION 6: CONCLUSIONS

The survey results and the estimated sector-level sales, employment and fibre-use indicate that the industry has grown during the 1990's. Total employment in the industry increased by an estimated 2,797 jobs (24%) over the 1990 – 97 period and sales (measured in nominal terms) increased by $1.15 billion (75%). Although the industry is, for the most part, heavily dependent on the BC market it has developed a significant export presence in the US and Asian markets for a selection of the business types. Indeed, in 1997 about 40% of reported sales were sold directly into export markets.

Despite the under-utilization of capacity reported in 1997 operations (in the order of 20-30%), about one-half of the firms in the Working Sample indicated an intention to expand their capacity during the next three years. The total planned expansion equaled about 55% of existing 1997 capacity. Wood supply in terms of availability, price, quality and price volatility was a constraint to sector expansion identified by the respondents. Over 85% of respondents identified wood supply as a constraint to expansion of secondary manufacturing in British Columbia. Both labour and markets were identified by about 65% of the respondents as constraints to capacity expansion. Specifically, these constraints were labour cost, skills and flexibility, US market access, and market diversification.

Encouraging growth in secondary manufacturing is a stated objective in most jurisdictions with a substantial commercial forestry sector or at least a domestic market for forest products. BC has a number of strengths to build upon in promoting secondary manufacturing. These strengths include: a high quality fibre supply, relatively competitive energy costs, an established position in the major markets which can afford to pay the price for BC products, research and development support, institutional support (e.g., MoF's Small Business Forest Enterprise Program, the value-added

program of Forest Renewal BC, producer associations), and a network of worker training facilities and programs.

However, although these strengths are important they are not sufficient to generate sustainable growth in secondary manufacturing. Sector stakeholders will need to develop an effective response to wood supply and pricing challenges, to improve the real cost of labour, to manage the high risk and cost of market identification and development, to improve research contributions, to encourage better access to capital, and to reduce tariff and non-tariff barriers in target markets. Gains in meeting these challenges will not be easy but they will complement the efforts of sector stakeholders to increase the economic contributions of secondary manufacturing.

Given the forecasts for global industrial timber demands, rising standards of living, and the inherent renewable nature of sustainable managed timber resources, there are reasons to be optimistic about the potential for growth in secondary manufacturing. However, this optimism should be tempered with the reality that markets for secondary manufactured products are highly competitive and that innovative products in secondary manufacturing rapidly evolve into maturity with modest margins. Among other things, success in these markets will require accurate strategic development, tight cost control in manufacturing and positioning, a nimble management, complementary public policy and a degree of serendipity.

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APPENDIX A

Survey of BC Secondary Manufacturing

There are two parts to the survey. Part A asks for basic information to support the publication of a BC secondary manufacturing company/product directory.

Please fill out Part A regardless of whether or not you fill out part B.

Part B contains questions which cannot be linked to any individual company.

Part A

Mail Part A separately in the envelope provided. It doesn't matter which envelope is used for which Part.

Company Name:

.....

Mailing Address: .....

.....

.....

Name of Contact Person

❑ Mr. ❑ Ms. .....

Phone (.....) ..... Fax (.....).....

1. Will you be forwarding PART B to the questionnaire?
   ❑ Yes ❑ No

2. Check the category that accounts for the majority of 1997 sales.

❑ **Roundwood mill**(commodity, specialty, shakes/shingles)
❑ **Reman products** (lumber specialties, fencing, panels)

❑ **Engineered wood products** (beams, trusses, prefab buildings, log homes, treated wood)
❑ **Millwork** (doors, windows, architectural and custom woodwork, turned wood products, mouldings)
❑ **Cabinets** (kitchen/vanity cabinets, cabinet doors, countertops)
❑ **Furniture** (household, RTA, commercial, institutional and patio)
❑ **Pallets and containers** (pallets, boxes, bins, crates)
❑ **Other Wood Products** (crafts, wood novelties)
❑ **Other (specify)** .....

3. List the major products manufactured at your plant

(a).....

(b).....

(c).....

(d).....

4. Identify the species used (total = 100%)

- lodgepole pine .....% spruce .....% balsam .....%
- Douglas-fir .....% hemlock .....% Cedar .....%
- Other Softwoods (specify) .....%
- Hardwoods (specify)
  .....% .....% .....%

5. What are your current market areas?

❑ BC ❑ Rest of Canada ❑ US

❑ Europe ❑ Japan ❑ Rest of Asia

❑ Other (specify) .....

6. Would you like to have a copy of the BC secondary manufacturing company/product directory sent to you?

❑ Yes ❑ No

Part B

Mail Part B separately in the envelope provided.

Part B does not contain any information which allows linkage to Part A of the survey. Thus, individual company data cannot be identified.

1. Check the Forest Region in which the mill/plant site is located.

- ❑ Vancouver Region
- ❑ Cariboo Region
- ❑ Prince George Region
- ❑ Kamloops Region
- ❑ Nelson Region
- ❑ Prince Rupert Region

or identify community .....

2. Which manufacturing association(s) does your firm belong to?

❑ BC Wood ❑ ILRA ❑ CIWPA ❑ Cariboo

❑ IVAWA ❑ VIAWP ❑ Kootenay WoodVine

❑ Log Home ❑ Other (specify)..... ❑ None

3. Check the category that accounts for the majority of 1997 sales.

- ❑ **Roundwood mill**(commodity, specialty, shakes/shingles)
- ❑ **Reman products** (lumber specialties, fencing, panels)
- ❑ **Engineered wood products** (beams, trusses, prefab buildings, log homes, treated wood)
- ❑ **Millwork** (doors, windows, architectural & custom woodwork, turned wood products, mouldings)
- ❑ **Cabinets** (kitchen/vanity cabinets, cabinet doors, countertops)
- ❑ **Furniture** (household, RTA, commercial, institutional and patio)
- ❑ **Pallets and containers** (pallets, boxes, bins, crates)
- ❑ **Other wood products** (crafts, wood novelties)
- ❑ **Other** (specify) .....

4. Products Manufactured - List products and indicate approximate % of 1997 total sales revenue.

(a)..... .....% (b)..... .....%

(c)..... .....% (d)..... .....%

(e)..... .....%

5. 1997 Markets (based on sales revenue) Approximate.

BC ..... % Other Canada ..... % USA ..... % Europe ..... %

Japan.....% Rest of Asia ..... % Other (specify).....%

6. Average number of full time equivalent employees in 1997:

❑ 1-5 ❑ 6-10 ❑ 11-15 ❑ 16-25

❑ 26-50 ❑ 51-75 ❑ 76-100 ❑ 101-150

❑ 151-200 ❑ more (please specify) .....

7. Approximately what level of capacity was the plant operating in 1997? .....%

Was this a: ❑ 1 shift basis
❑ 2 shift basis
❑ Other (specify).....

8. Major machinery and size used in plant.

machine	size
•	.....
•	.....
•	.....
•	.....

9. Which custom processes do you provide? Please check.

❑ Kiln Drying ❑ Planing

❑ Resawing ❑ Other(specify).....

10. Approximate volume of wood raw material used in 1997?

- Logs ..... m^3
- Lumber ..... Mfbm
- Plywood ..... Sq. Ft. (3/8")
- OSB ..... Sq. Ft. (3/8")
- Other ..... (specify units) .....

11. Species used and approximate % of volume (total = 100%):

- lodgepole pine .....% spruce .....% balsam .....%
- Douglas-fir .....% hemlock .....% Cedar .....%
- Other Softwoods (specify) .....%
- Hardwoods (specify) .....% .....% .....%

12. Sources of lumber/log supply (approximate) percent:

- BC market purchases.....%
- Purchases outside of BC.....%
- SBFEP Sales* .....%
- Other tenures (not SBFEP).....%

* either direct supply or in the form of lumber or log trades.

13. Have you ever applied for Small Business Forest Enterprise Program timber sale?
❑ Yes ❑ No

14. Do you plan to expand capacity in the next three years?
❑ Yes ❑ No

If yes, by what % will you expand capacity? .....%

15. What do you see as the major constraints to expansion of secondary manufacturing in BC?

a. Wood supply

❑ volume ❑ quality/grade

❑ price ❑ price volatility

❑ other (specify) .....

.....

.....

b. Labour

❑ training/skills ❑ cost ❑ flexibility

❑ other (specify) .....

.....

.....

c. Markets

❑ access to US quota ❑ market diversification

❑ product diversification ❑ market/product research

❑ other (specify) .....

.....

.....

16. Approximate 1997 sales revenue (FOB mill - Canadian $)

❑ Less than 1 million ❑ 1.1 - 3.0 million ❑ 3.1 - 5.0 million

❑ 5.1 - 7.0 million ❑ 7.1 to 10 million ❑ 10.1- 15 million

❑ 15.1 - 25 million ❑ 25.1 - 35 million

❑ over 35 million (please specify) .....

17. What proportion of 1997 operating costs do each of the following represent (approximate)

- Wood Costs .....%
- Labour and benefits .....%
- Interest .....%
- Depreciation .....%
- Other production costs (specify)

....%

....%

....%

Total **100%**

Appendix B

Listing of Products Within Each Business Type

1. Remanufactured Products

   - lumber specialties
   - custom processing
   - cutstock
   - decking
   - sawmill specialties
   - fencing
   - siding

2. Engineered Wood Products

   - laminated beams
   - trusses
   - prefab buildings
   - log homes
   - treated wood
   - laminated veneer lumber

3. Millwork

   - doors
   - windows
   - moulding
   - flooring
   - architectural woodwork
   - turned wood
   - stairs

4. Cabinets

   - kitchen cabinets
   - vanity cabinets
   - cabinet doors
   - countertops

5. Furniture

   - household
   - RTA
   - commercial & institutional
   - patio

6. Pallets and Containers

   - pallets
   - shipping materials
   - boxes, bins & crates

7. Shakes and Shingles

8. Panelboards

   - plywood
   - particleboard
   - oriented strandboard
   - medium density fibreboard

9. Other Wood Products

   - poles & posts
   - veneer
   - instruments
   - wood novelties
   - woodcrafts